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ABSTRACT

Eighty undergraduates were administered four self-report locus of control inventories, in order to evaluate the convergent and discriminant validity of four categories common to these inventories: chance, fate, personal control, and powerful others. The four inventories were: (1) Internal, Powerful Others and Chance scales; (2) James Internal External Locus of Control Scale; (3) Nowicki Strickland Locus of Control Scale; and (4) Rotter Internal External Locus of Control Scale. Pearson correlations were computed between methods (inventories), and traits (categories), to construct a multitrait-multimethod matrix, following the Campbell and Fiske model. Validity was evaluated by observing intercorrelations among cells in the matrix. Convergent validity was consistently demonstrated for only one category--fate; discriminant validity was not evident for any comparison category across the four instruments. Rates of validity over all comparisons were 66.6% for convergent and 12.5% for discriminant. One explanation for inconsistent findings across locus of control studies is that the multitrait-multimethod matrix accounts for more variability than the categories measured. (The appendix lists items in each instrument which measure chance, fate, personal control, and powerful others.) (CP)

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Convergent and Discriminant Validity of the Locus of Control Construct

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The I-E Scale (Rotter, 1966) defines Locus of Control (LOC) as the degree to which a person believes that his life is within his own control. Rotter has regarded the construct as a unidimensional, bipolar factor. Other investigators (Gurin, Gurin, & Beattie, 1969; Kleiber & Manaster, 1972; Kleiber, Veldman, & Menaker, 1973; Lao, 1970; Levenson, 1972 & 1973; MacDonald, 1973; and Mirels, 1970), however, have presented evidence, mainly through factor analysis, that LOC is multidimensional. New instruments have appeared since the Rotter I-E Scale; some as an effort to remedy the multidimensional finding by presenting a more unidimensional measure and others as an alternative to Rotter's two statement-forced choice response format. Factor analysis of these new scales frequently report dimensions of belief in personal control (Gurin, et al., 1969), non-belief in luck or chance (Kleiber, et al., 1973) and belief in social system modification (Gurin, et al., 1969).

The present study evaluated the validity of the constructs in common among LOC instruments. The validity model reported by Campbell and Fiske (1959) was employed. This model requires that both convergent and discriminant validity be demonstrated.

Convergent validity is a confirmation of dimensions (or traits) by independent measuring methods that requires significant correlation between two instruments measuring the same trait. Discriminant validity requires

that the correlation between different methods measuring the same trait exceed (a) the correlations obtained between the trait and any other trait not having method in common and (b) the correlations between different traits which happen to employ the same method. One can identify constructs which pass specified tests of convergent and discriminant validity by determining intercorrelations among categories in a multitrait-multimethod matrix. These procedures were applied to the following data to ascertain the convergent and discriminant validity of four locus of control instruments.

Method. The data were obtained from 80 upper-division undergraduate students at the University of Texas at Austin. Each subject was asked to complete a booklet containing four locus of control scales.

The four scales selected for this study were (1) the Internal, Powerful others and Chance scales, IPC (Levenson, 1972), (2) the James Internal-External Locus of Control Scale (James, 1957), (3) the Nowicki-Strickland Scale for Adults, ANS-IE (Nowicki & Duke, 1973), and (4) the Rotter Internal-External Locus of Control Scale (Rotter, 1966). These instruments are paper and pencil self-report inventories and were selected for study because of their frequent citation in the literature, common dimensions and variation in response format.

The IPC and the James I-E scale employ a Likert-type format with six and four alternatives, respectively, which allow the respondent to indicate the strength of his/her attitude to each item. The ANS-IE scale is composed of questions which are answered by responding "yes" or "no" to each item. The Rotter scale employs a forced choice format in which two statements supporting opposite viewpoints are presented and the respondent is instructed to choose the one with which he/she most agrees.

Items from each system were grouped according to similarity of content and four categories derived common to all four instruments. The four categories, considered common across instruments were: chance; fate; personal control; and powerful others. Items were assigned to categories by two independent judges. A few items that were not consistently assigned to categories by the judges were omitted from the analysis. Appendix A lists the constituent instrument items which comprise each comparison category.

Once categories had been identified, Pearson product-moment correlations were computed between methods (instruments) and traits (categories). These correlations were used to construct the multitrait-multimethod matrix. Six heterotrait-heteromethod blocks were formed, one for every two-system comparison. These blocks contained those values in which categories may or may not coincide but systems differ. The complete multitrait-multimethod matrix is presented in Table 1.

Insert Table 1 About Here

For each block in the matrix a diagonal (called the validity diagonal) is formed through the heterotrait-heteromethod block by the series of cells in which categories coincide but systems differ. Values in the validity diagonal which are significantly different from zero are evidence of convergent validity. Discriminant validity must be assessed in two steps. First, each validity value is compared with all values in its row and column in the heterotrait-heteromethod block to determine whether the correlation between different methods of measuring the same category exceeds correlations between that category and other categories not having method in common.

Second, the heterotrait-monomethod triangles are examined to determine whether the correlation between different methods of measuring the same category exceeds correlations between that category and other categories which have method in common. This step is completed by comparing each category's validity diagonal value with values in the heterotrait-monomethod triangles in which that category is involved. This two-step procedure was carried out for each validity diagonal value in each of the six blocks in the matrix and the results summarized in Table 2.

Insert Table 2 About Here

Results. Table 2 indicates the validity diagonal value for each comparison category (CC) across the four instruments. In addition, data are presented pertaining to each diagonal values's discriminant validity (the highest value in the relevant parts of the heteromethod and monomethod blocks and the number of times that validity value was exceeded in each of these blocks).

Table 2 indicates that none of the CC's exhibited convergent and discriminant validity across all six instrument comparisons. Of the 24 validity diagonal values, three satisfied the necessary requirements as evidenced by values significantly different from zero (convergent validity) and values greater than all other appropriate values in the relevant heteromethod and monomethod blocks (discriminant validity). The three values that reached both convergent and discriminant validity were CC1, chance, (IPC vs. James), CC3, personal control, (ANS-IE vs. IPC), and CC4, powerful others, (Rotter vs. James).

Although none of the CC's consistently attained both convergent and

discriminant validity across all intruments, CC1's diagonal values were significant from zero across all instruments, indicating perfect convergent validity. Also, the validity diagonals for CC1 were not exceeded by heteromethod values on any except the "ANS-IE vs. IPC" instrument comparison and then by only one value, indicating fairly good discriminant validity, for the first of the two step process for evaluating discriminant validity. However, the validity diagonals for CC1 were exceeded by one, two, or three values in the monomethod blocks for five of the six comparisons, indicating that the methods used for measuring CC1 correlated higher than did the traits that were purportedly in common. Thus, CC1 fared considerably poorer in the second step of the evaluation. No other CC's evidenced convergent validity across even half of the six comparisons, precluding any attempts to evaluate the discriminant validity of other categories.

In summary, convergent validity was consistently demonstrated for only one comparison category and discriminant validity was not consistently demonstrated for any comparison category across the four systems. Thus, of the four CC's analyzed, none conformed to both convergent and discriminant validity across all comparisons according to Campbell and Fiske's criteria.

Discussion. The purpose of this research was to evaluate the convergent and discriminant validity of dimensions of locus of control. It was the investigators' belief that at least one explanation for the large number of inconsistent findings in studies utilizing the locus of control concept was that the dimensions studied may not exhibit convergent and discriminant validity. The findings of this study support this conviction, since none of the four categories investigated passed tests for both con-

vergent and discriminant validity.

One possible explanation for inconsistent findings across locus of control studies may be that the measurement method employed accounts for more variability than the constructs measured. Method variance is demonstrated when two different traits employing the same method correlate higher than the same trait measured differently. For example, the Chance and Powerful others scales on the IPC correlated .6176. Such a correlation indicates an obvious redundancy between the two dimensions making it difficult for heteromethod-monotrait correlations to exceed this value. Although, two thirds of the validity diagonal values attained convergent validity, they did not reach the first criterion for discriminant validity. That is, the heterotrait-heteromethod values were higher than the monotrait-heteromethod values.

In summary, the high rate of convergent validity (66.6% over all comparisons) and the low rate of discriminant validity (12.5% over all comparisons) suggest that LOC scales investigated in this study may not be measuring the constructs they purport to measure.

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Table 1

Intercorrelation of Locus of
Control Constructs by Instruments

	Hanna Levenson				James				ANS-IE			
	*L 1	F 2	P 3	O 4	L 5	F 6	P 7	O 8	L 9	F 10	P 11	O 12
1		313	071	618	713	481	388	216	381	327	-227	030
2			164	380	423	515	408	245	172	231	113	-103
3				013	-019	235	147	162	-017	-078	267	098
4					647	474	446	224	410	281	-208	021
5						539	592	300	493	481	-029	-017
6							562	320	333	324	136	137
7								278	472	196	131	241
8									206	113	059	031
9										416	114	108
10											003	102
11												185
12												
13												
14												
15												
16												

*L = Luck, F = Fate, P = Personal Control, O = Powerful Others

Table 1
(continued)
Intercorrelation of Locus of
Control Constructs by Instruments

	Rotter			
	L	F	P	O
	13	14	15	16
	594	233	381	259
	218	110	137	159
	147	197	149	027
	426	046	412	259
	500	272	356	433
	390	446	397	233
	348	178	330	315
	250	-011	209	471
	438	178	208	269
	347	305	239	275
	-060	165	031	-004
	077	128	125	-146
		389	500	251
			301	263
				296

TABLE 2

IPC, James, ANS-IE, and Rotter
Locus of Control Scales

	IPC VS. JAMES					JAMES VS. ANS-IE				
Comparison Category	Validity Diagonal Value	Highest Value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher	Validity Diagonal Value	Highest value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher
CC1 Chance	.7128*	.6473	0	.6176	0	.4925*	.4814	0	.5918	2
CC2 Fate	.5151*	.4809	0	.5623	2	.3243*	.4814	2	.5388	3
CC3 Personal Control	.1466	.4457	5	.5918	4	.1311	.4721	5	.5918	4
CC4 Powerful Others	.2244*	.6474	4	.6176	5	.0305	.2405	5	.3198	6

*p < .05

TABLE 2
(continued)
IPC, James, ANS-IE, and Rotter
Locus of Control Scales

	ANS-IE VS. ROTTER					ROTTER VS. IPC				
Comparison Category	Validity Diagonal Value	Highest Value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher	Validity Diagonal Value	Highest value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher
CC1. Chance	.4381*	.3470	0	.5003	1	.5940*	.4255	0	.6176	1
CC2. Fate	.3053*	.3470	1	.4155	2	.1096	.2334	5	.3892	6
CC3. Personal Control	.0308	.2391	5	.5003	5	.1487	.4124	3	.5003	4
CC4. Powerful Others	-.1464	.2748	2	.2961	4	.2585*	.2586	1	.6176	4

*p < .05

TABLE 2
(continued)
IPC, James, ANS-IE, and Rotter
Locus of Control Scales

	ROTTER VS. JAMES					ANS-IE VS. IPC				
Comparison Category	Validity Diagonal Value	Highest Value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher	Validity Diagonal Value	Highest value in Hetero-method	No. Higher	Highest Value in Mono-method	No. Higher
CC1 Chance	.4997*	.4329	0	.5918	3	.3810*	.4103	1	.6176	2
CC2 Fate	.4464*	.3966	0	.5623	2	.2307*	.3799	3	.4155	3
CC3 Personal Control	.3296*	.3966	3	.5918	3	.2665*	-.2273	0	.1845	0
CC4 Powerful Others	.4712*	.4329	0	.3198	0	.0212	.4103	6	.6176	6

*p < .05

Appendix A

HANNA LEVENSON

Fate

I have often found that what is going to happen will happen.

It's chiefly a matter of fate whether or not I have a few friends or many friends.

Luck

To a great extent my life is controlled by accidental happenings.

Often there is no chance of protecting my personal interest from bad luck happenings.

When I get what I want, it's usually because I'm lucky.

Whether or not I get into a car accident is mostly a matter of luck.

It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.

Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.

Personal Control

Whether or not I get to be a leader depends mostly on my ability.

Whether or not I get into a car accident depends mostly on how good a driver I am.

When I make plans, I am almost certain to make them work.

How many friends I have depends on how nice a person I am.

I can pretty much determine what will happen in my life.

I am usually able to protect my personal interests.

When I get what I want, it's usually because I worked hard for it.

My life is determined by my own actions.

Powerful Others:

I feel like what happens in my life is mostly determined by powerful people.

Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.

My life is chiefly controlled by powerful others.

People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.

Getting what I want requires pleasing those people above me.

If important people were to decide they didn't like me, I probably wouldn't make many friends.

Whether or not I get into a car accident depends mostly on the other driver.

In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.

JAMES

Fate

Wars between countries seem inevitable despite efforts to prevent them.

Some people seem born to fail while others seem born for success no matter what they do.

I feel that many people could be described as victims of circumstances beyond their control.

I have usually found that what is going to happen will happen, regardless of my actions.

I don't believe that a person can really be a master of his fate.

There's not much use in worrying about things . . .what will be, will be.

Luck

It is usually true of successful people that their good breaks far outweighed their bad breaks.

Many times I feel that we might just as well make many of our decisions by flipping a coin.

Getting a good job seems to be largely a matter of being lucky enough to be in the right place at the right time.

A great deal that happens to me is probably just a matter of chance.

It isn't wise to plan too far ahead because most things turn out to be a matter of good or bad fortune anyhow.

When things are going well for me I consider it due to a run of good luck.

Most people don't realize the extent to which their lives are controlled by accidental happenings.

Most of the disappointing things in my life have contained a large element of chance.

Success is mostly a matter of getting good breaks.

I think that life is mostly a gamble.

Personal Control

I feel that I have little influence over the way people behave.

Success in dealing with people seems to be more a matter of the other person's moods and feelings at the time rather than one's own actions.

Many times I feel that I have little influence over the things that happen to me.

Sometimes I feel that I don't have enough control over the direction my life is taking.

Powerful Others

It is difficult for ordinary people to have much control over what politicians do in office.

It seems many times that the grades one gets in school are more dependent on the teacher's whims than on what the student can really do.

Fate

Do you believe that most problems will solve themselves if you just don't fool with them?

Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?

Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do?

Do you believe that most people are just born good at sports?

Luck

Are some people just born lucky?

Do you think that cheering more than luck helps a team to win?

If you find a four leaf clover, do you believe that it might bring you good luck?

Have you ever had a good luck charm?

Do you think it's better to be smart than to be lucky?

Personal Control

Do you believe that you can stop yourself from catching a cold?

Do you believe that if somebody studies hard enough he or she can pass any subject?

Do you feel that when you do something wrong there's very little you can do to make it right?

Do you feel that you have a lot of choice in deciding who your friends are?

Did you often feel that whether or not you did your homework had much to do with what kind of grades you got?

Do you feel that when a person your age is angry at you, there's little you can do to stop him or her?

Do you believe that whether or not people like you depends on how you act?

Most of the time, do you feel that you can change what might happen tomorrow by what you do today?

Do you think that people can get their own way if they just keep trying?

Most of the time do you find it useless to try to get your own way at home?

Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?

Do you feel that it's easy to get friends to do what you want them to do?

Do you usually feel that you have little to say about what you get to eat at home?

Are you the find of person who believes that planning ahead makes things turn out better?

Most of the time, do you feel that you have little to say about what your family decides to do?

Powerful-Others

Did you feel that it was nearly impossible to change your parent's mind about anything?

ROTTER

Fate

a. One of the major reasons why we have wars is because people don't take enough interest in politics.

b. There will always be wars, no matter how hard people try to prevent them.

a. I have often found that what is going to happen will happen.

b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

a. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

Luck

a. Many of the unhappy things in people's lives are partly due to bad luck.

b. People's misfortunes result from the mistakes they make.

a. The idea that teachers are unfair to students is nonsense.

b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

a. Without the right breaks one cannot be an effective leader.

b. Capable people who fail to become leaders have not taken advantage of their opportunities.

a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

b. Getting a good job depends mainly on being in the right place at the right time.

a. When I make plans, I am almost certain that I can make them work.

b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

a. In my case getting what I want has little or nothing to do with luck.

b. Many times we might just as well decide what to do by flipping a coin.

a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

b. There really is no such thing as "luck."

Personal Control

a. In the long run people get the respect they deserve in this world.

b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

a. No matter how hard you try some people just don't like you.

b. People who can't get others to like them don't understand how to get along with others.

a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

a. Many times I feel that I have little influence over the things that happen to me.

b. It is impossible for me to believe that chance or luck plays an important role in my life.

a. What happens to me is my own doing.

b. Sometimes I feel that I don't have enough control over the direction my life is taking.

Powerful Others

a. The average citizen can have an influence in government decisions.

b. This world is run by the few people in power, and there is not much the little guy can do about it.

a. With enough effort we can wipe out political corruption.

b. It is difficult for people to have much control over the things politicians do in office.

a. People are lonely because they don't try to be friendly.

b. There's not much use in trying too hard to please people, if they like you, they like you.